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HAYNES BEFFEL & WOLFELD LLP			SMITH, JACKSON R	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/796,582	SHINGLETON ET AL.	
Examiner	Art Unit		
Jack Smith	1709		

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### **Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Offic  later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Statyus

1)  Responsive to communication(s) filed on \_\_\_\_\_.  
2a)  This action is **FINAL**.                    2b)  This action is non-final.  
3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## **Disposition of Claims**

4)  Claim(s) 1-36 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-36 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on 09 March 2004 is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date See *Continuation Sheet*.  
4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.  
5)  Notice of Informal Patent Application  
6)  Other: \_\_\_\_.

Continuation of Attachment(s) 3. Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :8/30/04, 8/10/05, 2/14/06, 4/18/06.

## DETAILED ACTION

### *Information Disclosure Statement*

1. The information disclosure statement filed 5/18/07 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

### *Drawings*

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the specific initiations of claims 26 (i.e., "a rail transportation element" included in the modular features of the system of claim 1), 27 (i.e., "a fuel cell charging system" included in the modular features of the system of claim 1), 28 (i.e., "a hydrogen production device" included in

the modular features of the system of claim 1), 29 (i.e., "a hydrogen storage device" included in the modular features of the system of claim 1), 30 (i.e., "inverters for converting dc to ac electricity" included in the modular features of the system of claim 1), 31 (i.e., "electrical wireways" included in the modular features of the system of claim 1), 32 (i.e., "elements which facilitate roller skating, ice skating, car shows, horse riding, housing the homeless, farmers markets, soccer matches, tennis matches, concerts, lightshows, fitness, transportation nodes" included in the modular features of the system of claim 1), must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Double Patenting***

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-5 and 33 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 of Shingleton (US Patent 6,058,930).

This is a provisional obviousness-type double patenting rejection as 10/633027 has not yet issued.

The limitations of instant claims 1-5 and 33 are fully encompassed by the limitations of claims 1-5 of Shingleton (US Patent 6,058,930).

5. Claims 1-5 and 8-35 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-35 of copending Application No. 10/796299 in view of Shingleton (US Patent 6,058,930).

This is a provisional obviousness-type double patenting rejection as 10/633027 has not yet issued.

The limitations of instant claims 1-5 and 8-35 are fully encompassed by the limitations of claims 1-35 in Application No. 10/796299 except for the limitations regarding the tracking mechanism (claims 1-5 and 33).

As to claims 1 and 33, Shingleton discloses a modular shade system in Figures 2A-2C. That the solar panels (34) of the system of Shingleton are "attached" to the torsion tube according to teachings in column 2, lines 36-37, implies that the solar cells and torsion tube are not a single, monolithic apparatus (i.e., that different solar cells may be attached to the apparatus in a "moldular" fashion). Said system contains solar tracking panels (solar panels, 34) for use on a support surface (support surface is shown in Figure 2A as the surface to which the system is affixed via footing, 38) comprising: a series of generally North-South oriented, spaced apart torque tubes (torque tube, 32, that is North-South oriented according to the first line of the abstract), each torque tube having an axis (as shown in Figure 2A); panels mounted to at least some of the torque tubes (as instructed in column 5, lines 57-60) to create spaced-apart rows of panels along said torque tubes (that the panels are spaced apart is shown by the space between adjacent panels, 34, in Figure 13), at least some of the panels being solar collector panels (all of the panels, 34, are solar panels); a shade structure (this

enhanced shading is provided by the panels) positioned at a selected location between selected ones of the torque tubes and above the support surface so to provide an enhanced shaded region thereunder (the panels are fixed to the torque tubes as described above); a support structure comprising: a first mounting assembly (torque arm 46, rod member 44, body portion of linear actuator 43, fixed mount 45 and bearing 40) for mounting each torque tube above the support surface for rotation about the axis of each said torque tube (mounting is shown in Figure 2A and the rotation motion is illustrated in Figure 2C) and a second mounting (footing, 38, and pier, 36) for supporting the shade structure at the selected location; and a tilting assembly as part of the first mounting assembly (actuator, 42, body portion of actuator 43, and fixed mount, 45) selectively rotating each torque tube about its axis (again, as shown in Figure 2C). As Shingleton teaches in column 1, lines 27-30, the use of such a tracking system keeps the "panels as square to the sun as possible." It would have been obvious to one of ordinary skill in the art at the time of the invention to add the tracking system of Shingleton to the modular shade system of Application No. 10/796299 in order to keep the solar panels as square to the sun as possible.

As to claim 2, the first mounting assembly of Shingleton comprises: pivot connectors (the pivot connectors between the solar cell mount and torque arm 46, are clearly visible in Figure 2B and the pivoting motion of the solar panels, 34, with respect to the first mounting assembly is demonstrated in Figures 2A-2C); Southside supports (fixed mount 45) pivotally connected to the torque tubes by the pivot connectors (it is clear from Figure 2B that 25 is pivotally connected to torque tubes 32 via the first mount

assembly including the pivot connectors shown in the figure; the pivoting motion is shown in Figure 2C) ; and Northside supports (torque arm 46) pivotally connected to the torque tubes by the pivot connectors (as also shown in Figure 2B).

As to claim 3, the Southside and Northside supports of claim 1 of Shingleton (i.e., fixed mount 45 and torque arm 46, respectively) comprise vertical posts in the representation of Figure 2A.

As to claim 4, the second mounting assembly of Shingleton comprises vertically extending posts (pier, 36) supporting East-West extending shade support bars (the torque tubes, 32, also function as East-West extending shade support bars as shown in Figure 2A).

As to claim 5, the tilting assembly of Shingleton comprises a drive element (horizontal tracker driver described in column 5, lines 64-67) associated with each torque tube, a drive element coupler operably coupling each drive element (generally horizontal rod member, 44) , and a driver (linear actuator, 42) drivingly coupled to at least one drive element (the actuator driver, 42, is coupled to 44 as shown in Figure 2A) to simultaneously rotate the torque tubes about their associated axes and simultaneously tilt the panels mounted to the torque tubes (as illustrated best in Figure 2C).

#### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 26-29 and 32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains.

As to claim 26, there is no mention in either the specification or the claims as to how to incorporate the rail network into one of the modules of the system of claim 1, nor is there any description of the structure of such a rail network.

As to claim 27, there is no mention in either the specification or the claims as to how to incorporate the fuel cell charging system into one of the modules of the system of claim 1, nor is there any description of the structure of such a fuel cell charging system.

As to claim 28, there is no mention in either the specification or the claims as to how to incorporate the hydrogen production device into one of the modules of the system of claim 1, nor is there any description of the structure of such a hydrogen production device.

As to claim 29, there is no mention in either the specification or the claims as to how to incorporate the hydrogen storage device into one of the modules of the system of claim 1, nor is there any description of the structure of such a hydrogen storage device.

As to claim 32, there is no mention in either the specification or the claims as to how to incorporate the elements which facilitate roller skating, ice skating, car shows,

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horse riding, housing the homeless, farmers markets, soccer matches, tennis matches, concerts, lightshows, fitness, transportation nodes into one of the modules of the system of claim 1, nor is there any description of the structure of any such element.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 21-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The intention of claim 21 is to provide “modular features for multi-functionality and customization” as a further limitation to claim 1. However, this limitation is vague and indefinite, particularly given that the system disclosed in claim 1 is already labeled as “a modular shade system.” There is no specific information in this claim with regard to the additional functional features being imparted to or the customization being performed on the system in claim 1 and has been treated as not reciting any further structural limitations.

#### ***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-5, 8, 12, 21 and 33-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Shingleton (US Patent 6,058,930).

As to claims 1 and 33, Shingleton discloses a modular shade system (Figures 2A-2C, that said system is "modular" is inherent in its use of solar panels 34 that may be fixed or removed) with solar tracking panels (solar panels, 34) for use on a support surface (support surface is shown in Figure 2A as the surface to which the system is affixed via footing, 38) comprising: a series of generally North-South oriented, spaced apart torque tubes (torque tube, 32, that is North-South oriented according to the first line of the abstract), each torque tube having an axis (as shown in Figure 2A); panels mounted to at least some of the torque tubes (as instructed in column 5, lines 57-60) to create spaced-apart rows of panels along said torque tubes (that the panels are spaced apart is shown by the space between adjacent panels, 34, in Figure 13), at least some of the panels being solar collector panels (all of the panels, 34, are solar panels); a shade structure (this enhanced shading is provided by the panels) positioned at a selected location between selected ones of the torque tubes and above the support surface so to provide an enhanced shaded region thereunder (the panels are fixed to the torque tubes as described above); a support structure comprising: a first mounting assembly (torque arm 46, rod member 44, body portion of linear actuator 43, fixed mount 45 and bearing 40) for mounting each torque tube above the support surface for rotation about the axis of each said torque tube (mounting is shown in Figure 2A and the rotation motion is illustrated in Figure 2C) and a second mounting (footing, 38, and pier, 36) for supporting the shade structure at the selected location; and a tilting

assembly as part of the first mounting assembly (actuator, 42, body portion of actuator 43, and fixed mount, 45) selectively rotating each torque tube about its axis (again, as shown in Figure 2C).

As to claim 2, the first mounting assembly of Shingleton comprises: pivot connectors (the pivot connectors between the solar cell mount and torque arm 46, are clearly visible in Figure 2B and the pivoting motion of the solar panels, 34, with respect to the first mounting assembly is demonstrated in Figures 2A-2C); Southside supports (fixed mount 45) pivotally connected to the torque tubes by the pivot connectors (it is clear from Figure 2B that 25 is pivotally connected to torque tubes 32 via the first mount assembly including the pivot connectors shown in the figure; the pivoting motion is shown in Figure 2C) ; and Northside supports (torque arm 46) pivotally connected to the torque tubes by the pivot connectors (as also shown in Figure 2B).

As to claim 3, the Southside and Northside supports of claim 1 of Shingleton (i.e., fixed mount 45 and torque arm 46, respectively) comprise vertical posts in the representation of Figure 2A.

As to claim 4, the second mounting assembly of Shingleton comprises vertically extending posts (pier, 36) supporting East-West extending shade support bars (the torque tubes, 32, also function as East-West extending shade support bars as shown in Figure 2A).

As to claim 5, the tilting assembly of Shingleton comprises a drive element (horizontal tracker driver described in column 5, lines 64-67) associated with each torque tube, a drive element coupler operably coupling each drive element (generally

horizontal rod member, 44) , and a driver (linear actuator, 42) drivingly coupled to at least one drive element (the actuator driver, 42, is coupled to 44 as shown in Figure 2A) to simultaneously rotate the torque tubes about their associated axes and simultaneously tilt the panels mounted to the torque tubes (as illustrated best in Figure 2C).

As to claim 8, that the solar panels (34) of the system of Shingleton are “attached” to the torsion tube according to teachings in column 2, lines 36-37. Such an attachment step implies that the solar cells and torsion tube are not a single, monolithic apparatus (i.e., that different solar cells may be attached to the apparatus in a “moldular” fashion).

As to claim 12, the modular panels of Shingleton are solar panels (column 5, line 57) or PV panels.

As to claim 21, this claim continues to read on the device of Shingleton since no further structural limitations have been recited.

As to claims 34 and 35, Shingleton explains that the modular shade system is anchored to the “earth” via the pier footing (abstract). Shingleton further explains, in column 8 lines 41-45, that the term “earth” may mean “soils and natural surfaces” (i.e., the ground) or “building rooftop[s]” which implies that the support surface comprises a roof.

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of Olah (US Patent 6,399,874).

As to claims 6 and 7, the modular shade system of Shingleton meets all the limitations of claim 1 above. What Shingleton fails to disclose is that the solar collector panels comprise a light concentrator type of Solar collector panel.

Olah discloses a solar energy module that uses a Fresnel lens as a light concentrator (title and abstract as well as column 2 lines 7-10). As Olah explains in column 1 lines 25-35, such concentrators are used to "increase the electrical output" of the solar energy cell by "increasing the intensity of the sunlight" striking the cell. It would have been obvious to one of ordinary skill in the art at the time of the invention to add the solar concentrator of Olah to the modular shade system of Shingleton in order to increase the electrical output of the solar cells in said system by increasing the intensity of the sunlight striking each of them. This modified shade system of Shingleton would, then, contain solar collector panels that comprise a light concentrator type of photovoltaic (PV) panel.

14. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of Berman et al. (US Patent 4,663,085).

The modular shade system of Shingleton meets all the limitations of claim 8 above, but fails to include that the modular panels comprise light-transmissive panels.

Berman et al. disclose a light-transmissive solar panel in Figure 1 (transparent photovoltaic panel, 10) which may be used on a roof-top (see Figure 7) to provide transmitted light that is not used for photovoltaic conversion for other purposes such as illuminating the interior of a dwelling (abstract, last sentence). Further, the PV panels of Berman et al. (transparent photovoltaic panel, 10) are light-transmissive PV panels. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the light-transmissive solar panel of Berman et al. to the modular shade system of Shingleton in order to provide light for non-photovoltaic purposes such as illuminating the interior of a dwelling. In this modified system, the light-transmissive panels would be placed adjacent to one another (as instructed by Shingleton in Figures 9A-9C) and, since the light transmissive panels are also PV panels, the modular panels comprise PV panels and light-transmissive panels.

15. Claims 13, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of Catella et al. (US Patent 4,611,090).

As to claim 13, the modular shade system of Shingleton meets all the limitations of claim 12 above, above but fails to teach protective panels mounted to the shading system subassembly opposite the lower surfaces of the PV modules.

Catella et al. disclose an assembly (semi-rigid support member, 10) for a structural support for a photovoltaic module in Figure 1. The construction of the assembly contains a protective panel mounted to the photovoltaic module subassembly

in the form of rib stiffeners (20) and a rectangular structure (23) opposite the lower surfaces to the PV modules (as shown with a mounted photovoltaic module, 22, in Figure 4). Catella et al. explain that the purpose of the protective panel is both to support the photovoltaic module (column 6, lines 65 – 8) and to "secure electrical wiring connections between the photovoltaic module and adjacent photovoltaic modules or a current collecting means" (column 7, lines 30-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the protective panel of Catella et al. to the modular shade system of Roderick et al. in order to both support the photovoltaic module and secure electrical wiring connections between the photovoltaic module and adjacent photovoltaic modules or a current collecting means.

As to claim 14, Catella et al. further explain that the semi-rigid support member (10) and the protective panel that forms a part of it may be composed of steel, aluminum, plastic (polycarbonate), etc. in column 4, lines 18-28.

As to claim 17, the protective panels of Catella et al. are perforated in the sense that they contain a total of nine holes (see Figure 1).

16. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930), Catella et al. (US Patent 4,611,090) as applied to claim 13 above in further view of Berman et al. (US Patent 4,663,085).

As to claim 15, the combination of Shingleton and Catella et al. above discloses all the features of claim 13. Further, the protective panels of Catella et al. have holes between the rib stiffeners (20) that permit some light to pass through as shown in Figure

1. What the combination of Roderick et al. and Catella et al. fails to provide is that the PV modules are constructed to permit some light to pass therethrough.

Berman et al. disclose a light-transmissive solar panel in Figure 1 (transparent photovoltaic panel, 10) which may be used on a roof-top (see Figure 7) to provide transmitted light that is not used for photovoltaic conversion for other purposes such as illuminating the interior of a dwelling (abstract, last sentence). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the light-transmissive solar panel of Berman et al. to the combination of Shingleton and Catella et al. as applied to claim 13 above in order to provide light for non-photovoltaic purposes such as illuminating the interior of a dwelling.

17. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930), Catella et al. (US Patent 4,611,090) as applied to claims 8 and 31 above and in further view of Yamawaki et al. (US patent 6,489,552 B2).

The combination of Roderick et al. and Catella et al. discloses all the features of claim 13 above, but fails to teach that the protective panels have a convex lower surface.

Yamawaki et al. disclose a solar cell module (photovoltaic cell module tile body and photovoltaic module, 1 and 6, respectively, in Figure 1A) for covering a roof board. The photovoltaic module tile body (1) acts as a protective panel for the photovoltaic module (6). As Yamawaki et al. teach in column 5, lines 1-3, said photovoltaic tile body has a recessed convex portion (rectangular terminal-box storing recess, 3) which provides a space for the terminal box associated with the photovoltaic module or solar

cell (6). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the recessed convex portion of the protective panel of Yamawaki et al. to the modular shade system of the combination of Roderick et al. and Catella et al. as applied to claims 8 and 31 above in order to provide a space for the terminal box associated with the solar cell.

18. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of Blieden et al. (US patent 4,153,813).

Roderick et al. discloses all the features of claim 1 above but fail to teach that the supplemental panels comprise phosphorescent panels to provide passive nighttime illumination or that the supplemental panels comprise illuminated panels.

Blieden et al. disclose a luminescent member (16) which consists of a luminescent agent capable of phosphorescence (column 1, line 33-34) that is optically coupled to a photovoltaic cell (18) in Figure 3 . Blieden et al. explain that the purpose of said luminescent member is to aid in the collection of low angle incident light (column 1, lines 57-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the luminescent member of Blieden et al. to the modular shade system of Shingleton in order to aid in the collection of low angle incident light. Doing so would automatically provide passive nighttime illumination beneath the support structure of Shingleton. Finally, panels in said combination of the devices of Roderick et al. and Blieden et al. are illuminated by virtue of their inclusion of the luminescent member.

19. Claims 20, 22, 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of McDonough et al. (US Patent 6,606,823).

As to claim 20, Shingleton discloses all the features of claims 1 and 8 above but fail to disclose that the supplemental panels comprise space cooling elements comprising at least one of spray misters for evaporative cooling, fans, pumps, wetted canvas, water storage containers, tubing, and evaporative spouts.

McDonough et al. disclose a modular roof covering system (Figures 1 – 4) that provides a light weight and low cost roof covering that in order to extend the longevity of the environment, manage store water runoff and collect and utilize solar energy (column 1, lines 39-45). The panels or modules of McDonough et al. contain a spray mister (sprinkler system, 30 and 31, Figure 4) in order to “provide water irrigation for the vegetation” (Column 2, lines 5-8). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modules of McDonough et al. (Figure 2) as supplemental panels in the modular shade system of Shingleton in order to provide water irrigation for vegetation. By virtue of the various modular features of the system of McDonough et al. (e.g., the supplemental panels providing irrigation, etc.), the combined system of Shingleton would include modular features for multifunctionality and customization.

As to claims 22 and 23, Shingleton discloses all the features of claim 1 above and claim 21 above. What Shingleton fails to disclose is that the modular features

include elements for space cooling comprising at least one of spray, fans, pumps, wetted canvas, water storage containers, tubing, and evaporative spouts or that

McDonough et al. disclose a modular roof covering system (Figures 1 – 4) that provides a light weight and low cost roof covering that in order to extend the longevity of the environment, manage store water runoff and collect and utilize solar energy (column 1, lines 39-45). The panels or modules of McDonough et al. contain a spray element for space cooling (sprinkler system, 30 and 31, Figure 4) in order to “provide water irrigation for the vegetation or additional cooling for the building” (Column 2, lines 5-8). The panels or modules of McDonough et al. further comprise water collection containers (troughs and ridges, 11 and 12, shown in Figure 1) to “provide structural stability and precipitation or water storage capability” (Column 4, lines 10-13). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modules of McDonough et al. (Figure 2) as supplemental panels in the modular shade system of Roderick et al. in order to provide additional cooling for the building.

As to claim 25, Shingleton discloses all the features of claim 1 above and claim 21 continues to read on the device of Shingleton since it cites no further structural limitations. What Shingleton fails to disclose is that the modular features modular features comprise at least one of seating elements, planting elements, playground elements, restroom elements, signage elements, antennae modules, payment machines, and stage elements.

McDonough et al. disclose a modular roof covering system (Figures 1 – 4) that provides a light weight and low cost roof covering that in order to extend the longevity of

the environment, manage store water runoff and collect and utilize solar energy (column 1, lines 39-45). The panels or modules of McDonough et al. contain comprise a planting element as shown in (Figure 2) and explained in column 5, lines 35-41) in order to support plant growth (Column 1, line 60). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the planting element of McDonough et al. (Figure 2) as supplemental panels in the modular shade system of Roderick et al. in order to support plant growth and extend the longevity of the environment.

20. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of Nakajima et al. (JP Patent Abstract Publication 10002063A).

Shingleton discloses all the features of claim 1 above and claim 21 above. What Shingleton fails to disclose is that the modular features comprise acoustical control panels.

Nakajima et al. disclose a "Lightweight Concrete Roof Tile" as part of a roof covering system (Figures 1 and 4) that is meant to provide shade while both enhancing heat insulation and insulate for sound (abstract, paragraph 57). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the lightweight concrete roof tiles of Nakajima et al. as in the modular shade system of Shingleton in order to both enhance heat insulation and insulate for sound.

21. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of Pendley (US Patent 7,069,704 B2).

Shingleton discloses all the features of claim 1 above and claim 21 above. What Shingleton fails to disclose is that the modular features comprise a rail transportation element.

Pendley discloses a roofing rail transportation system (Figures 1 and 3) which has a rail transportation element (rail car, 11) for transporting roofing materials upon an uncompleted roof (abstract, line 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the rail transportation element (11) and system of Pendley to the modular shade system of Shingleton in order to transport roofing materials upon an uncompleted roof.

22. Claim 27 is rejected as being unpatentable over Shingleton (US Patent 6,058,930) in view of Shugar et al. (US Patent 6,702,370 B2).

Shingleton discloses all the features of claim 1 above and claim 21 above. What Shingleton fails to disclose is that the modular features comprise a fuel cell charging system.

Shugar et al. discloses an electrical vehicle roof that contains a roof-mounted PV roof assembly (PV roof assembly, 6) that can be used with "fuel-cell powered vehicles" (Figure 1 caption) in order to charge a battery or fuel cell (Column 1, lines 50-54). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the roof mounted PV assembly and associated and fuel-cell charging system of Shugar et al. to the modular shade system of Shingleton in order to charge a battery or fuel cell.

23. Claim 28 is rejected as being unpatentable over Shingleton (US Patent 6,058,930) in view of Kravitz et al. (US Patent 4,106,952).

Shingleton discloses all the features of claim 1 above and claim 21 above. What Shingleton fails to disclose is that the modular features comprise a hydrogen production device.

Kravitz discloses a solar panel unit (Figures 1 and 2) that can be incorporated as part of a hydrogen production device by providing the electrical energy for the production of hydrogen through electrolysis (Column 4, lines 19-22). Using the solar panel unit in the manner described by Kravitz in the modular shade system of Shingleton would ensure that the modular features of the latter comprise a hydrogen production device. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the solar panel unit of Kravitz et al. and associated electrolysis mechanism to the modular shade system of Shingleton in order to produce hydrogen through electrolysis.

24. Claim 29 is rejected as being unpatentable over Shingleton (US Patent 6,058,930) in view of Scott (US Patent 6,367,573).

Shingleton discloses all the features of claim 1 above and claim 21 above. What Shingleton fails to disclose is that the modular features comprise a fuel cell charging system.

Scott discloses a cylindrical mount for a fuel system (Figures 1) that stores fuel on the rooftop of a bus using a series of cylindrical tanks. Although Scott mentions CNG fuel supply specifically, Scott also states in Column 2, lines 8 – 16 that the

apparatus is suitable for mounting cylinders regardless of their contents. Such cylinders would be suitable for containing hydrogen or any other gas. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the storage tank assembly of Scott to the modular shade system of Shingleton in order to store fuel on a rooftop. Such a system would be capable of storing hydrogen and, therefore, would have modular features comprising a hydrogen storage device.

25. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of West et al. (US Patent 7,099,169 B2).

Shingleton discloses all the features of claim 1 above and claim 21 above. What Shingleton fails to disclose is that the modular features comprise inverters for converting dc to ac electricity or electrical wireways.

West et al. disclose a full-bridge inverter (as part of the "DC to AC converter," 50) in Figure 1 to convert the erratic DC power produced by an array of solar cells (photovoltaic array, 3) to a standard 120 V AC power usable by a utility grid (utility grid, 60) as explained in column 1 lines 7-11 and lines 31-33. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the full-bridge inverter of West et al. in the modular features of the shade system of Shingleton in order to convert the erratic DC power produced by the array of solar cells in the latter to a standard 120 V AC power usable by a utility grid. The full-bridge inverter (50) of West et al. contains multiple electrical wireways as depicted in the circuit diagram of Figure 1.

26. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of McCalley (US Patent 6,415,557).

Shingleton discloses all the features of claim 1 above and claim 21 above. What Shingleton fails to disclose is that the modular features comprise elements which facilitate roller skating, ice skating, car shows, horse riding, housing the homeless, farmers markets, soccer matches, tennis matches, concerts, lightshows, fitness, transportation nodes.

McCalley discloses a modular, above ground protective structure (protective structure, 20) described in Column 3, lines 21-37 and shown in Figure 1 that can be used to provide protective refuge to occupants (Column 3, line 23). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the protective structure of McCalley to the modular shade system of Shingleton in order to provide protective refuge to occupants. It is an inherent property of such a structure to also provide shelter to, and therefore facilitate, any number of activities including: roller skating, ice skating, car shows, horse riding, housing the homeless, farmers markets, soccer matches, tennis matches, concerts, lightshows, fitness. Further, it is also an inherent property of such a structure to provide shelter for, and therefore facilitate, transportation nodes.

27. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shingleton (US Patent 6,058,930) in view of Morton (US Patent 6,341,451 B1).

Shingleton discloses all the features of claim 33 above but fails to provide that the support surface comprises a vehicular parking area having parking stalls at the enhanced shaded region and the traffic regions adjacent to the parking stalls.

Morton teaches a portable garage apparatus (title) that has a roof (top wall structure, 12) that supports solar cells (see Figure 1 and solar energy panels 21,22). As Morton explains in the abstract, this structure is deal for "providing shelter to a vehicle" when the owner of said vehicle does not have a garage. As can be seen in Figure 1, this potable garage has a parking stall (portion of the floor, 13, enclosed by the walls of the structure). Further, Morton discloses the use of a ramp (26) leading to the opening of the garage "being adapted to allow a vehicle to enter the building structure" (column 3, lines 64-66). This implies that the region adjacent to the ramp (26) is a traffic region which is also adjacent to the parking stall region defined above. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the portable garage apparatus of Morton in conjunction with the roof-mounted modular shade system of Shingleton in order to provide shelter to a vehicle when the owner of said vehicle does not have a garage.

### ***Conclusion***

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Smith whose telephone number is (571) 272-9814. The examiner can normally be reached on 7:30 a.m. - 5:00 p.m., Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1709

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